



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/089,719	04/04/2002	Katsuya Nagayama	50212-380	1195

20277 7590 09/10/2004

MCDERMOTT WILL & EMERY LLP
600 13TH STREET, N.W.
WASHINGTON, DC 20005-3096

EXAMINER

HUG, ERIC J

ART UNIT	PAPER NUMBER
----------	--------------

1731

DATE MAILED: 09/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<p align="center">Office Action Summary</p>	Application No. 10/089,719	Applicant(s) NAGAYAMA ET AL.	
	Examiner Eric Hug	Art Unit 1731	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 April 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 is/are rejected.
- 7) ☒ Claim(s) 2 and 3 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 April 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shang (EP 0 321 182) in view of Okubo et al (JP 11-116264).

Shang discloses a method to decrease the temperature of a drawn fiber in a controlled manner to result in relatively low absorption losses in the fiber. Drawing furnace 23 operating at in a temperature range of 2100-2200 degrees C is used to heat an optical fiber preform. Helium may be provided to the drawing furnace (see column 6, lines 28-32). A tubular recovery chamber 31 adjacent to the drawing furnace is used to achieve a controlled decrease in temperature. See Figure 2 and column 6, line 54 to column 7, line 32. It is clear that the fiber may be within the claimed temperature range of 1400-1800 degrees C when it is exposed to the recovery tube 31. The tubular recovery chamber of Shang may be heated, or a gas at an elevated temperature may be introduced into the chamber. See column 6, lines 50-53. Shang discloses a seal between the draw furnace and the recovery chamber to prevent the ingress of uncontrolled ambient air into the chamber adjacent to the furnace. See column 6, lines 18-21. Shang also discloses the addition of additional gas into the furnace near the seal between the furnace and the recovery chamber. This gas stream will tend to disrupt any boundary layer which may have

formed adjacent the fiber, and it is believed that this disruption will cause differential cooling of the fiber which could result in diameter variations or fiber bow.

Regarding claim 1, Shang discloses all the necessary features except that there is no express disclosure that the gas provided to the recovery tube is lower in thermal conductivity than that of helium. Okubo is cited here to provide motivation for choosing a second gas that meets the claimed condition. Okubo discloses a first furnace tube for heating and drawing an optical fiber from a preform, and a second furnace tube positioned at the delivery side of the first furnace tube for controlled cooling of the fiber. The first furnace tube contains helium gas and the second furnace tube contains argon gas, which has a lower conductivity than helium. The use of two gases in this manner provides for improved fiber transmission characteristics, i.e., lower absorption loss. Therefore, at the time of the invention, it would have been obvious to one skilled in the art to choose a gas such as argon for the recovery tube of Shang as taught by Okubo for controlling and slowing the cooling rate of a drawn optical fiber and for minimizing absorption loss.

Allowable Subject Matter

Claims 2 and 3 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Claims 2 and 3 are allowable for further providing a barrier that separates the gas mixture from the air and is provided with a gas outlet for letting out the helium gas.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Van Der Giessen et al (US 4,673,427) discloses a device for drawing an optical fiber using a laminar gas flow vessel to restrict the temperature drop of the fiber during cooling.

Blankenship et al (US 5,059,229) discloses drawing an optical fiber in a furnace having a hydrogen-containing atmosphere. Inert gas can be flowed into the bottom portion of the furnace to remove the hydrogen gas before exposure to air.

Harvey et al (US 5,284,499). Harvey teaches a method of drawing and cooling optical fibers whereby the drawing furnace has an atmosphere of helium in order to avoid thermal stresses in the cladding layer.

Ohga et al (US 5,320,658) discloses a device for drawing an optical fiber whereby a heating furnace is provided between a drawing furnace and a coating device. The heating furnace comprises a muffle tube kept in an atmosphere of inert gas, oxygen, or hydrogen.

Lysson et al (US 5,545,246) discloses drawing an optical fiber in a furnace having a protective gas surrounding the preform and an additional flushing gas provided at the drawing portion of the furnace.

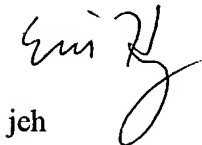
Lysson et al (US 5,897,681) discloses drawing an optical fiber in a furnace provided with an increasing amount of helium gas in the drawing direction.

Rosenkranz (US 6,010,741) discloses a conventional optical fiber production process, whereby a fiber is drawn from a molten preform in a drawing furnace. The drawn fiber passes through a cooling unit in a protective gas flow which protects the surface of the fiber from aggressive air constituents and dust particles. An admixture of helium and nitrogen is suggested.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric Hug whose telephone number is 571 272-1192. The examiner can normally be reached on Monday through Friday, 10:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


jeh